IN THE CLAIMS:

1. (Original) An apparatus for monitoring a structure and for locating the position of an event including;

a light source;

a waveguide for receiving light from the light source so that the light is caused to propagate in both directions along the waveguide to thereby provide counter-propagating optical signals in the waveguide, the waveguide being capable of having the counter-propagating optical signals or some characteristic of the signals modified or effected by an external parameter caused by or indicative of the event to provide modified counter-propagating optical signals which continue to propagate along the waveguide; and

detector means for detecting the modified counter-propagating optical signals effected by the parameter and for determining the time difference between the receipt of the modified counter-propagating optical signals in order to determine the location of the event.

2. (Original) The apparatus of claim 1 wherein the waveguide is a silica waveguide.

3. (Previously amended) The apparatus of claim 1 wherein light source is for launching simultaneously into opposite ends of the waveguide.

4. (Previously amended) The apparatus of claim 1 wherein the light source is a single light source.

5. (Previously amended) The apparatus of claim 1 wherein the waveguide is one or more optical fibres which forms an event sensitive optical fibre.

6. (Previously amended) The apparatus of claim 1 wherein further silica waveguides are connected to the said waveguide at either or both ends in order to add additional delay between the transmissive counter-propagating signals and to provide insensitive lead waveguides.

7. (Previously amended) The apparatus of claim 1 wherein the detector means comprises:

first and second photodetectors for simultaneously receiving the radiation from the counter-propagating signals in the waveguide; and

processing means for receiving signals from the first and second photodetectors for determining the time delay or difference between the signals effected from the same disturbance and therefore determining the location of the sensed event.

8. (Original) The apparatus of claim 7 wherein a waveguide coupler or set of couplers is arranged between the light source and the photodetectors and the silica waveguide so that the light can be simultaneously transmitted from the light source to both ends of the silica waveguide and the detector means also being connected to the coupler or couplers so that the counter-propagating transmissive radiation can be directed via the coupler or couplers from the silica waveguide to the detector means.

9. (Previously amended) The apparatus of claim 1 wherein the waveguide is for connection to the structure to monitor the structure.

10. (Previously amended) The apparatus of claim 1 wherein the structure comprises the waveguide for transmitting data along the waveguide from one place to another and the waveguide simultaneously receiving the light from the light source to provide the counter-propagating optical signals so as to enable the integrity and security of the waveguide to be monitored.

11. (Previously amended) The apparatus according to claim 1 wherein the detector also identifies or quantifies the parameter from the modified counter-propagating optical signals.

12. (Previously amended) The apparatus of claim 1 wherein waveguide is arranged in a loop configuration so that light can be simultaneously launched into both ends of the waveguide from a single light source.

13. (Previously amended) The method of claim 11 wherein data signals are supplied to the waveguide so that the waveguide acts as a communication link for transmission of data from one place to another and the launching of the counter-propagating optical signals in the waveguide enables the integrity and security of the waveguide to be monitored.

14. (Original) The apparatus according to claim 11 wherein the waveguide is applied to a structure to monitor the structure.

15-18. (Cancelled)

19. (Currently amended) A waveguide transmissive counter-propagating signal method for locating events in optical waveguides, which may include:

providing a sensing optical fibre formed from a waveguide material designed to simultaneously transmit counter-propagating optical signals;

providing a detector for locating events in optical waveguides;

providing a lead optical fibre formed from a waveguide material which acts as an insensitive light guide between the sensing fibre and detector;

providing a lead optical fibre formed from a waveguide material which acts as an insensitive light guide between the sensing fibre and a light source;

connecting the sensor waveguide and the lead optical fibres at a splice so that cores of the waveguides are aligned and remain fixed at the splice;

launching counter-propagating light signals into the sensing optical fibre and lead optical fibres, which light signals are modified upon disturbance of the sensing optical fibre so that modified counter propagating optical signals continue to propagate along the sensing fibre;

delivering the modified counter-propagating signals from the waveguide fibre, via the lead optical fibres, to the detector so the time difference between the receipt of the modified counter-propagating signals may be measured and utilised to determine the location of the sensed event; and

registering any changes in the waveguide sensor optical signals so that the sensed parameter may be quantified and/or identified.

20. (Original) An apparatus for monitoring an optic fibre communication link into which data signals are launched and from which the data signals are received, and for locating the position of a disturbance to the link including;

a light source for launching light into the link so that the light is caused to propagate in both directions along the link to thereby provide counter-propagating optical signals in the link, the link being capable of having the counter-propagating optical signals or some characteristic of the signals modified or effected by the disturbance to provide modified counter-propagating optical signals which continue to propagate along the link; and

detector means for detecting the modified counter-propagating optical signals and for determining the time difference between the receipt of the modified counter-propagating optical signals in order to determine the location of the disturbance.

21. (Original) The apparatus of claim 20 wherein the link is a silica waveguide .

22. (Previously amended) The apparatus of claim 20 wherein the light source is for launching simultaneously into opposite ends of the link.

23. (Previously amended) The apparatus of claim 20 wherein the light source is a single light source.

24. (Previously amended) The apparatus of claim 20 wherein the detector means comprises:

first and second photodetectors for simultaneously receiving the light from the counter-propagating signals in the link; and

processing means for receiving signals from the first and second photodetectors for determining the time delay or difference between the signals effected from the same disturbance and therefore determining the location of the disturbance.

25. (Original) The apparatus of claim 24 wherein a waveguide coupler or set of couplers is arranged between the light source and the photodetectors and the link so that the light can be simultaneously transmitted from the light source to both ends of the link and the detector means also being connected to the coupler or couplers so that the counter-propagating signals can be directed via the coupler or couplers from the link to the detector means.

26-28. (Cancelled)